

IMPLEMENTING A DELIRIUM ASSESSMENT TOOL TO INCREASE
ROUTINE ASSESSMENT IN HOSPICE PATIENTS

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A Project Report Submitted to
The faculty of the School of Nursing at
The University of North Carolina at Greensboro
In Partial Fulfillment
Of the Requirements for the
Doctor of Nursing Practice

Greensboro
2023

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Dedication

I would like to dedicate this DNP project to my family. To my husband, Eric, who has given me endless love, support, and inspiration to keep going. I am grateful for your selfless commitment to taking care of our family for the last four years, making it possible for me to pursue and achieve my dream. I truly could not have done this without you. To my beautiful children, Sophia, Abe, and Phin, who have made me so proud with their own amazing accomplishments along the way. I appreciate your love, patience, and encouragement even when I was not always able to be present. I cannot wait to have more time together with all of you.

And to my parents, who have always believed in me, even when I took the scenic route to get here. I would not be the person I am today without your unconditional love and support.

Acknowledgements

Thank you to Dr. Rebecca Kalinoski, DNP, PMHNP-BC, my project advisor. I appreciate your guidance and positive feedback. Thank you for helping me stay on track.

Thank you to Dr. Carlos Monguilod, MD, HMDC, FAAHPM for being my provider champion for this project. You have been an excellent mentor and educator to me for the last 13 years. It is an honor to work with you and learn from you.

Thank you to Ashley Thompson, BSN, RN for supporting this project. I am grateful for your time and collaboration to help with planning, organizing, and data collection.

Abstract

Background: Hospice care focuses on palliation for individuals in the last six months of life.

Delirium is highly prevalent in this population and negatively impacts hospice patients, families, and clinicians. Delirium is often unrecognized, and research has shown that routine assessment

can increase delirium identification and improve care outcomes. **Purpose:** To implement a

delirium assessment tool in a hospice setting with aims to increase routine delirium assessment,

nursing knowledge, and family education. **Methods:** The PDSA cycle guided this quality

improvement project. In-patient hospice nurses completed a survey assessing delirium

knowledge, beliefs, and practices. Delirium education was provided, and the nurses were asked

to use the 4AT for routine assessment, once per shift. The nurses were asked to provide family

education for patients with a positive delirium score and document interventions. The nurse

survey was repeated after implementation to assess changes in delirium knowledge and practice.

Results: Routine assessments were completed 6% of the time. 90% of the patients assessed were

positive for delirium. The completion rate for family education was 23%. Nurses used non-

pharmacological interventions alone 41% of the time and pharmacologic interventions alone 7%

of the time. **Recommendations and Conclusion:** This data supported the high prevalence of

delirium among hospice patients. However, the hospice nurses did not find value in using the

4AT tool in the in-patient setting, and they were reluctant to provide delirium education with

families. Comprehensive delirium education and adequate staff resources are needed to

successfully incorporate a structured assessment process into routine practice.

Key Words: Delirium, hospice, terminal, end of life, palliative care, prevalence, incidence,

screening, assessment, diagnosis, impact, effects, consequences, treatment, intervention, therapy,

management, and cost.

Background and Significance

Hospice is a growing health care field that provides supportive services to individuals with a terminal diagnosis and prognosis of six months or less (Kline & Panosky, 2017). Medical expenses in the last year of life account for about 10% of all healthcare costs in the United States (May et al., 2021). Hospice allows medically complex, terminal patients to receive outpatient care that reduces the need for costly hospital readmissions. Research has shown that most patients prefer to die at home (Treece et al., 2018). Hospice utilizes an interdisciplinary team to provide holistic care in the patient's preferred setting, shifting the focus from aggressive treatment to palliation for persons approaching the end of life.

Many terminal patients and their families choose hospice care in hopes of achieving "a good death" (Kline & Panosky, 2017). For most people, a good death means dying with autonomy and dignity, in their desired location, with little or no suffering. Hospice clinicians strive to meet this ideal; however, achieving a good death can be challenging in many cases. End-stage disease progression can create a multitude of complex symptoms that require multifaceted management strategies (Johnson et al., 2005). One of the most challenging symptoms experienced by hospice patients is delirium (Watt et al., 2021).

Delirium is an acute psychomotor condition that can alter mental status, perception, and behavior, impact emotional and physical function, and severely impair quality of life (Oh et al., 2017; Schmitt et al., 2019). Common causes of delirium include infection, hypoxia, dehydration, drug toxicity, and global organ failure. Delirium has three subtypes: hypoactive, hyperactive, or mixed (Luth et al., 2021; Watt et al., 2019). Hypoactive delirium is characterized by somnolence and lethargy, decreased communication, and poor motor response. Hyperactive delirium can present as extreme agitation with restlessness, audiovisual hallucinations, and combative

behaviors. Finally, mixed delirium includes features of both hypoactive and hyperactive delirium with symptoms that may fluctuate in intensity and timing. This variation in presentation can make delirium difficult to recognize, leading to misdiagnosis and sub-optimal symptom management.

Hospice patients with advanced illnesses often have multiple risk factors for delirium (Mercandante et al., 2018). Recent data have shown that delirium is highly prevalent among hospice patients, with an estimated median range of one third of patients having delirium on admission to in-patient hospice or palliative care units. Prevalence then sharply increases as patients progress towards end of life (Arnold et al., 2021; Watt et al., 2019). Delirium can be reversible with early identification when the cause is known and treatable. However, when patients are nearing the end of life, delirium becomes irreversible and is known as terminal delirium (Southerland & Stilos, 2019). Terminal delirium is estimated to occur in up to 88% of patients in the final days to weeks of life (Watt et al., 2019).

Patients, families, and hospice clinicians prioritize palliative management and quality of life (Agar, 2020). Poor delirium management can cause significant patient discomfort and distress. Families and caregivers who witness unmanaged delirium often experience increased anxiety and caregiver burden. This can lead families to seek inappropriate, aggressive interventions, including hospitalization, at the end of life (Luta et al., 2021). Hospitalization is often counter to patient goals for end-of-life care, costly, and does not improve quality of life. Inpatient delirium among adults 65 years and older is estimated to cost \$6.6 billion to \$82.4 billion in the United States (Kinchin et al., 2021).

Research has shown that early detection and use of evidence-based interventions are core mechanisms to alleviate suffering and improve care outcomes (Agar, 2020, Southerland & Stilos,

2019). International guidelines recommend routine evaluation with validated delirium assessment tools to improve early detection (Scottish Palliative Care Guidelines, 2020). However, most hospice clinicians do not consistently utilize delirium screening or assessment tools (Harris et al., 2020). One recent survey reported that only 38% of clinicians in specialized hospice in-patient units (IPUs) used a tool to screen or diagnose delirium (Woodhouse et al., 2020). Multiple validated tools are available for providers to identify delirium and potentially improve management (Watt et al., 2021). Some of these tools are better suited for acute care settings, while others are more appropriate for hospice care. Hospice nurses have the most frequent contact with the patient and family, placing them in the best position to use a tool for routine delirium assessment, potentially improving practice, quality of care, and patient/family outcomes.

Purpose

This project aims to implement a validated delirium assessment tool that is effective, practical, and sustainable in a hospice setting. The project goals are to increase routine assessment and identification of delirium for hospice patients, increase nursing knowledge about delirium, and increase family education about delirium.

Review of Current Evidence

A comprehensive search strategy was utilized to find and evaluate current literature relevant to this project. Electronic databases searched include CINAHL Complete, PubMed, Scopus, ProQuest Central, Google Scholar, and Cochran Library. The search was limited to articles published from 2016 to the present, apart from seminal research and studies included in systematic reviews. Keywords searched include delirium, hospice, terminal, end of life, palliative care, prevalence, incidence, screening, assessment, diagnosis, impact, effects, consequences,

treatment, intervention, therapy, management, and cost. The initial search yielded 346 articles, and 46 articles were selected for this review. Articles included in this review were peer-reviewed, included adult patients in hospice or palliative settings, and were written in English. Articles were excluded if they did not relate to hospice or palliative patients, involved pediatric patients, or were not written in English.

Prevalence in Hospice and Palliative Care

Delirium disproportionately affects people with advanced age (> 65 years), cognitive impairment, sensory or functional deficits, and end-stage disease processes (Ramirez Echeverria & Paul, 2021). Hospice and palliative care patients are among the highest risk group for developing delirium (Mercandante et al., 2018). Research specific to hospice patients was limited; therefore, this review is expanded to include data for palliative care patients. Palliative care is a supportive service for any patient with one or more chronic diseases requiring expert symptom management (Watt et al., 2019). Palliative patients typically have a prognosis greater than six months, but they often have similar risk factors as hospice patients and eventually progress to require hospice care.

Current estimates of delirium prevalence in hospice and palliative populations are thought to be underestimated due to extreme variance in clinical screening, assessment, and diagnosis practices (Bush et al., 2017; Watt et al., 2019). A recent meta-analysis reported delirium point prevalence estimates up to 12% in community palliative patients, up to 57% in hospital palliative consultations, and up to 74% in inpatient palliative care units (Watt et al., 2019). Delirium prevalence then rises further, up to 88%, when patients are in the final days to weeks of life. Of the delirium subtypes, hypoactive is the most common, but is frequently overlooked due to overlapping symptomology with dementia, depression, or fatigue (Bramati &

Bruera, 2021; Bush et al., 2017). Mixed and hyperactive delirium can also be commonly misdiagnosed as pain and are often more difficult to manage. The high prevalence and variable presentation of delirium in hospice and palliative care can profoundly affect patients, families, hospice and palliative clinicians, and the healthcare system (Arnold et al., 2021; Ficucane et al., 2020; Watt et al., 2019).

Impact on Hospice and Palliative Care

The impact of delirium on patients is substantial. Patients who have recovered from delirium have recalled sudden disorientation and loss of control, leading to intense feelings of fear, distress, and powerlessness (Agar, 2020; Bramati & Bruera, 2021; Schmitt et al., 2019). Patients rated audiovisual hallucinations as particularly distressing. Hallucinations alter reality, can cause resistance to care, and threaten patient safety. In addition to causing significant psychological distress, delirium can also decrease mental awareness and communication with loved ones during an especially vulnerable time (Agar, 2020). According to Agar (2020), 92% of hospice patients rated awareness, autonomy, and communication as most important for quality of life. Delirium can prevent patients from completing end-of-life goals, such as resolving conflict and saying goodbye. Family caregivers sharing the patient delirium experience are also impacted in significant ways.

The family caregiver's response to witnessing and managing patient delirium is multidimensional (Luth et al., 2021). Family members providing care to delirious patients in the home may experience mental, emotional, and physical stress, frustration, and social isolation (Luth et al., 2021; Schmitt et al., 2019). Additionally, the unpredictable nature of delirium makes care and management complex and challenging. Family caregivers have reported feeling fear, helplessness, exhaustion, and inability to provide adequate care (Luth et al., 2021). Many

families require additional hired caregiver resources that can create substantial financial strain. These combined circumstances can lead to caregiver burnout and increase the risk for depression and anxiety. Furthermore, if delirium symptoms are poorly managed, the family may perceive their loved one experiencing unbearable suffering, contributing to complicated grief after the patient dies (Agar, 2020; Bramati & Bruera, 2021; Luth et al., 2021). Hospice nurses are also impacted when unmanaged delirium leads to poor patient and family outcomes.

The hospice philosophy emphasizes comfort and maximizing quality of life based on the patient and family goals throughout the dying process (Meier et al., 2020). A core element of hospice care is providing excellent symptom management. Once a patient or family makes the difficult decision to forego curative therapies and transition to comfort-only care, the expectation is that their hospice team will be able to alleviate distressing symptoms. Unmanaged delirium can create feelings of emotional stress, uncertainty, and frustration for the hospice nurse (Schmitt et al., 2019). Hospice nurses may lose the trust of the patient or family, causing feelings of guilt, helplessness, and inadequacy when they do not meet patient and family expectations. Furthermore, hospice nurses may experience inner conflict when a family seeks aggressive interventions, such as hospitalization, to treat unmanaged delirium.

Researchers have revealed that aggressive interventions at the end of life, including hospitalization, fail to improve quality of life and are frequently in opposition to the patient's final wishes. (Luta et al., 2021). Hospitalization for delirium is also costly for the healthcare system, with an estimated \$6.9 billion in Medicare dollars spent annually (Ramirez Echeverria & Paul, 2021). Studies comparing the cost of hospice care versus hospital care have shown that outpatient symptom management can reduce total health care costs by about 32% (Luta et al., 2021). Additionally, patients admitted with unmanaged delirium are labor intensive for hospital

staff and may place undue burden on limited hospital resources (Schmitt et al., 2019). Given the high prevalence and significant impact of delirium on the hospice care experience, it is essential for hospice nurses to use validated delirium assessment tools to ensure timely identification and appropriate management.

Assessment and Identification

The World Health Organization has recognized the importance of early delirium detection and ongoing assessment to help alleviate patient suffering in hospice and palliative populations (Agar, 2020). However, researchers posit that delirium often goes unrecognized because many hospice clinicians rely on clinical judgement alone, rather than a formal assessment tool to identify delirium (Watt et al., 2021). Furthermore, despite the number of validated delirium assessment tools in existence, few studies have examined their use with this specific population. Routine assessment using a validated tool can increase early identification, which is vital to determine proper management. Early identification of reversible delirium may allow for treatment in some cases, which can prolong the patient's quality of life. Alternatively, if the delirium is irreversible and terminal, prompt diagnosis remains necessary to initiate appropriate end-of-life interventions (Aligeti et al., 2016).

The Diagnostic and Statistical Manual for Mental Disorders (DSM-5) sets the gold standard criteria for delirium diagnosis (Appendix A). More than 30 delirium assessment tools have been validated to operationalize these criteria in clinical practice (Watt et al., 2021). However, research validating their use in hospice and palliative populations is limited (Jorgenson et al., 2017; Recchia et al., 2021; Watt et al., 2021). A recent systematic review examined 14 validated screening tools to establish their utility in the palliative care population and found the Confusion Assessment Method (CAM), Delirium Observation Screening Scale (DOSS), and the Memorial

Delirium Assessment Scale (MDAS) to have the highest sensitivity and specificity for this population (Watt et al. 2021).

The Confusion Assessment Method was introduced as a simple, standardized tool capable of detecting delirium in high-risk settings (Inouye et al., 1990). The CAM contains nine questions focusing on four specific delirium features and takes about 5 minutes to complete. The Delirium Observation Screening Scale was created to improve the early identification of delirium based on routine patient observation by the bedside nurse (Schuurmans, 2003). The DOSS contains 25 observable features of delirium that the nurse can rate on a 4-point Likert scale and takes 5-10 minutes to complete. The Memorial Delirium Assessment Scale was designed to diagnose delirium and measure severity (Breitbart et al., 1997). The MDSA includes ten diagnostic items and a four-point clinician-rated scale to quantify delirium severity in medically ill patients. The MDSA takes 10-15 minutes to complete.

The 4AT Delirium Assessment Tool and the Nursing Delirium Screening Scale (Nu-DESC) are also well-validated tools that have been studied more recently in hospice and palliative care (Arnold et al, 2022; Recchia et al., 2022; Sinchak & Deguzman, 2021). The 4AT is a delirium screening instrument designed for rapid assessment by healthcare clinicians in a variety of settings (MacLulich, 2011). It includes four items designed to assess for delirium and takes less than two minutes to complete. The Nu-DESC is an observational scale that can be used by nurses at the bedside for ongoing delirium assessment (Gaudreau et al., 2005). It assesses five-domains associated with delirium: orientation, behavior, communication, hallucinations, and psychomotor retardation. The Nu-DESC takes less than two minutes to complete and requires assessment once every eight-hour shift. Validation studies of both tools have shown to have high

sensitivity and specificity with hospice and palliative populations (Arnold et al, 2022; Recchia et al., 2022; Sinchak & Deguzman, 2021).

Delirium Management

Early identification is a critical first step toward appropriate delirium management. Once identified, providers need to know and use effective interventions to improve patient and family outcomes. Delirium management in hospice care can include treating potentially reversible causes, when appropriate, providing excellent patient/family education, and using nonpharmacologic or pharmacological interventions when necessary (Harris et al., 2020). The management course will vary depending on the patient's estimated prognosis at the time of onset, delirium sub-type (hypoactive, hyperactive, or mixed), as well as the patient and family goals of care.

Up to 50% of delirium episodes in hospice patients can be reversible if identified and treated early (Bush et al., 2017; Harris et al., 2020; Logan, 2018). Common reversible causes of delirium in hospice care include pain, infection, medications, and dehydration. Infections, such as pneumonia or urinary tract infections, that can be treated may temporarily restore the quality of life for hospice patients and prolong meaningful time with loved ones. Medications, such as opioids, benzodiazepines, and anticholinergics, frequently used for symptom management, are known to contribute to delirium (Logan, 2018). These medications should be reviewed and addressed if possible. Many hospice patients require opioids for palliation of pain or dyspnea (Bush et al., 2017). Opioid-induced neurotoxicity is a cause of delirium that can be treated with dose reduction or opioid rotation. Dehydration is expected but not often treated in hospice care; however, options for subcutaneous infusions are available and may reduce delirium symptoms related to metabolic imbalance (Bush et al., 2017).

Non-pharmacologic strategies are recognized as the most effective and preferred treatment for all three subtypes of delirium in hospice and palliative care (Harris et al., 2020). Successful non-pharmacologic management depends on education, communication, and patient/family support. Patient and family instruction about delirium risk, prevention, presentation, and interventions should occur early and be reinforced periodically (Harris et al., 2020; Logan, 2018). Frequent communication and collaboration with family caregivers is essential for the ongoing evaluation of support needs and response to treatment. Non-pharmacologic supportive care for patients with delirium include interventions such as reorientation and reassurance, creating a calm, peaceful environment with appropriate lighting and noise, utilizing glasses or hearing aids to maintain senses, ensuring optimal sleep hygiene, and providing familiar routines, objects, and people (Harris et al., 2020; Logan, 2018). When non-pharmacologic interventions fail to provide sufficient palliation of delirium symptoms or patient/caregiver safety becomes a concern, hospice providers must consider pharmacological management (Harris et al, 2020; Logan, 2018).

Hyperactive and mixed delirium can be exceptionally distressing and challenging to manage with non-pharmacologic interventions alone (Kates, 2020). Antipsychotics, widely used in hospice and palliative care, are considered the first-line treatment for delirium when symptoms are severe or irreversible (Bush et al., 2017; Sutherland & Stilos, 2019). Haloperidol has long been considered the practice standard for pharmacologic treatment, but newer generation antipsychotics, such as Quetiapine and Risperidone, may also be used. Research regarding the efficacy of antipsychotics for delirium at the end of life has been mixed, with some showing a positive benefit and others claiming little or no benefit (Agar et al., 2017; Fincucane et al., 2020; Sutherland & Stilos, 2019). A recent Cochrane review of the safety and efficacy of

pharmacologic delirium management for terminally ill patients found no high-quality evidence to support or refute the use of antipsychotic medications (Finucane et al., 2020). However, several studies have found evidence to support the use of antipsychotic medication with small doses of benzodiazepines for breakthrough symptoms (Ficucane et al., 2020; Sutherland & Stilos, 2019). Inconclusive data about the pharmacologic management of end-of-life delirium remains one of the most critical areas for future research.

Gaps in the literature

All research reviewed concluded that delirium is a common and significant issue in hospice and palliative care. However, estimates of delirium prevalence may be greatly affected by lack of recognition or misdiagnosis (Watt et al., 2019). There is a gap in the knowledge regarding delirium screening and diagnostic practices among hospice and palliative care clinicians. Most clinicians assess only when symptoms are already evident and diagnose based on clinical judgment alone, despite the availability of multiple validated tools (Harris et al., 2020; Watt et al., 2019). Routine screening would increase early diagnosis, allowing hospice providers to choose the appropriate management course based on shared decision-making with the family (Harris et al., 2020; Logan, 2018). Research is needed to identify why most hospice clinicians do not use formal delirium assessment tools in routine practice. Additionally, while many delirium assessment tools exist, data validating their utility in the hospice population is limited. Further research is needed to study which tool is most efficacious and specific to hospice care.

All research reviewed indicated that treating reversible causes of delirium, when appropriate, and non-pharmacologic interventions are the preferred management strategies for all sub-types of delirium in hospice and palliative care (Bush et al., 2017; Harris et al., 2020; Luth et

al., 2021). Early education and communication with family regarding delirium risk, presentation, management, and expectations were crucial unmet areas of delirium management that need to be addressed by hospice nurses. Antipsychotic medications are frequently used to treat hyperactive or mixed delirium; however, most current evidence does not fully support using antipsychotics alone (Ficucane et al., 2020; Oh et al., 2017). Future research should focus on the safety and efficacy of pharmacologic interventions for managing delirium in the hospice and palliative setting.

Conceptual Framework

Kurt Lewin was a pioneer of social psychology and organizational progress (Crosby, 2020). In 1951, Lewin developed a three-stage model of change that enables past knowledge to be rejected and replaced with current knowledge (Udod & Wagner, 2021). The three stages of this model are unfreezing, change, and refreezing. Unfreezing is the process in which people let go of old behaviors that are considered counterproductive. Change is the process of implementing a new behavior or practice that leads to the desired outcomes. Finally, Refreezing is the process of establishing the changed behavior or practice as a new habit. The unfreezing-change-refreezing model also acknowledges and examines the various forces that can positively or negatively impact the change process. Lewin's Change Theory (Appendix B) is commonly used in healthcare to guide practice changes and has provided the framework for this project.

As previously discussed, delirium is common among hospice patients and routine use of a delirium assessment tool would improve delirium identification and patient-family outcomes (Watt et al., 2021). However, the hospice organization chosen for this project does not currently utilize any delirium assessment tool in routine practice. Implementing a delirium assessment tool in this setting could improve early identification, delirium management, and outcomes for

hospice patients and their families. An organizational change must occur in the process of delirium identification to achieve the goals of this project.

Lewin's change theory requires an examination of the driving forces and restraining forces that affect the unfreezing process (Crosby, 2020). The primary investigator (PI) met with small group of key agency stakeholders who provided input to identify and examine the potential forces that may help or hinder the unfreezing process. The stakeholders included the agency Chief Medical Officer, the In-Patient Unit (IPU) Physician, and the IPU Director of Nursing (DON). Some anticipated driving forces for change included a desire to improve patient care outcomes, increase use of evidence-based practice, and to improve family education and satisfaction. Some anticipated restraining forces to change included time constraints, knowledge deficits, and staff reluctance to abandon old habits.

The stakeholders also identified a potential financial benefit for the agency if delirium identification changed the patient's level of care. There are four hospice levels of care depending on patient and caregiver needs (Medicare.gov, 2023). Routine level of care, most common, means the patient is generally stable with symptoms well managed. General-in-patient (GIP) level of care is crisis management of acute, uncontrolled symptoms provided in an inpatient setting. Continuous home care provides similar crisis management of acute, uncontrolled symptoms in the home setting. Finally, respite provides temporary inpatient care for stable patients to allow home caregivers to have a break. Medicare reimbursement is higher for GIP and continuous home care. Therefore, if a positive delirium score changes from routine to GIP level of care, the IPU will receive a higher reimbursement rate for that patient.

The stakeholders received information regarding delirium prevalence in hospice, the impact of mismanaged delirium, recommendations for the routine use of a formal delirium

assessment tool, and research regarding evidence-based practice. The stakeholders also received information regarding the validity, sensitivity, and specificity of the delirium assessment tool's discussed in this paper. Next, the PI and stakeholders discussed how to address the driving and restraining forces to launch the unfreezing process. This collaborative effort was meant to increase agency investment in the change process.

The stakeholders decided that the agency in-patient unit (IPU) would be the best setting for project implementation. To address staff time constraints, the IPU DON selected the 4AT delirium assessment tool for implementation. The 4AT is well validated and takes less than two minutes to complete (MacLulich, 2011). To address knowledge deficits and reluctance to abandon old habits, the PI created an educational PowerPoint presentation regarding delirium prevalence and its impact in hospice, the importance of early identification, and best practice recommendations. The presentation was designed to communicate evidence that would reinforce the driving forces towards change. The PI scheduled three in-person educational meetings and sent a voice-recorded PowerPoint presentation to all IPU nurses who were not able to attend the in-person meetings.

Implementation marked the beginning of the change stage of Lewin's model. The IPU nurses were all asked to attend one of the in-person education meetings and/or view the recorded power point prior to the implementation date. The IPU nurses were then asked to perform the 4AT assessment once per shift (every 12 hours). The IPU nurses were also asked to provide delirium education when a patient received a positive score and document interventions. It was decided that if routine assessment successfully demonstrates effective delirium identification and positively impacts clinical practice or offers a financial benefit, the practice may be adopted by the agency. The refreezing process would then solidify the change and make it a habit.

Methods

Hospice patients and families rely on their hospice team to achieve their goals, which commonly include autonomy, quality of life, meaningful time with loved ones, and excellent symptom management (Agar, 2020; Klankluang et al., 2021). Delirium can interfere considerably with these goals. Manifestations of delirium can develop rapidly, and symptoms can fluctuate widely, making identification and management onerous. As a result, delirium is frequently underrecognized or misdiagnosed, and subsequently, poorly managed. Unmanaged delirium can adversely impact the patient, family, hospice care team, and the healthcare system (Klankluang et al., 2021). Research has shown that routine assessment with validated tools can increase early identification of delirium, improve delirium management and positively affect the patient, family, and hospice clinician care experience.

Design

This is a quality improvement project designed to implement a delirium assessment tool that is effective, practical, and sustainable in a community hospice setting. This project aims to increase routine assessment and delirium identification in hospice patients, increase hospice nurse knowledge about delirium, and increase family education about delirium.

Translational Framework

The Plan-Do-Study-Act (PDSA) is a well-known model (Appendix C) used to implement a quality improvement change in healthcare and will serve as the translational framework for this project (Leis & Shojanian, 2016). The PDSA model is based on the scientific method and is cyclical. The planning stage involves identification of the problem and formulating a plan or intervention to address the problem. The do stage involves testing the intervention in action. The study stage involves evaluating and analyzing the plan or intervention in action to determine if it

had the desired result. The act stage involves modification of the plan or intervention using what was learned in the study stage. These stages continue to cycle until the plan or intervention brings about the desired results for quality improvement.

To operationalize the PDSA model for this project, the primary investigator (PI) met with key stakeholders who assisted with first stage (PLAN). Their input was used to conceptualize the problem and examine current practices. The stakeholders reviewed the research presented and applied this information to select the 4AT assessment tool. Next, the stakeholders and PI worked together to develop a plan for implementation and data collection.

In the second stage (DO), the IPU nurses were asked to voluntarily complete a pre-implementation survey designed to assess their current knowledge, beliefs, and practice regarding delirium. The IPU nurses were then asked to attend one of the in-person education meetings and/or view the recorded PowerPoint presentation. In addition to providing delirium education, the presentation also described the purpose of the project and the implementation plan using the PDSA model. The presentation also included guidance on how to use the 4AT tool in routine practice, how and why to complete family education, documenting interventions, and if the patient changed from routine to GIP level of care due to a positive delirium score.

During the third stage (STUDY), the PI requested weekly feedback from the IPU DON. The PI also met with one of the IPU nurses in the fourth week to obtain verbal feedback on the implementation process from the nursing perspective. The PI then met with the stakeholders in the fourth and fifth weeks to discuss data collection, evaluate implementation issues, and assess the need for any changes to the plan. The IPU DON verbally addressed concerns voiced by the staff regarding time constraints and providing family education to encourage continued participation throughout implementation. The IPU nurses were then asked to complete a post-

implementation survey to examine changes in knowledge, beliefs, and practices. The IPU DON and PI met again after the project conclusion to further evaluate feedback.

In the final stage (ACT), the PI created a dissemination poster to present the project results and recommendations to the stakeholders. The stakeholders reviewed the results to determine if the practice change will improve the quality of care within the organization.

Population

The target population for this project included all patients with a terminal diagnosis admitted to the hospice inpatient unit (IPU) for respite, symptom management, or end-of-life care from September 26th, 2022, to November 7th, 2022. Patients found to have a positive delirium score were included for additional evaluation of patient/family education and delirium management interventions. No protected health information (PHI) was collected. The project population also included all IPU hospice nurses who participated with implementation during this time frame. IPU hospice nurses are defined as registered nurses (RNs). Nurse participation was voluntary, and the nursing staff did not need to meet any inclusion or exclusion criteria for participation. Nursing staff involved in implementation reported their level of education and number of years working in hospice.

Setting

This project took place within the in-patient unit (IPU) for a community non-profit hospice agency. This organization provides hospice and palliative care services in urban, suburban, and rural home care settings, in various long-term care settings, and within two IPUs. The Greensboro IPU was chosen for implementation of the assessment tool. This is a fourteen-bed IPU with an average daily census of about 10 patients. In addition, this IPU employs 22

nurses (RNs) who work in 12 hours shifts to provide respite, general inpatient, and end-of-life care for a diverse group of hospice patients.

Project Implementation

This project aimed to implement a delirium assessment tool that is user-friendly, time efficient, and effective for routine delirium assessment and early delirium identification. The primary investigator (PI) met with key agency stakeholders to develop a project implementation plan using the PDSA model. The PDSA stakeholders included the agency Chief Medical Officer, the IPU Physician, and the IPU Director of Nursing (DON).

The PI met separately with each stakeholder at least twice before implementation to present research, gather data, clearly identify the problem, and discuss the implementation plan. Multiple options for validated assessment tools were presented to the IPU DON for consideration. The IPU DON selected the 4AT delirium assessment tool. The IPU DON and PI solidified a plan for project implementation to begin on September 26th, 2022. The assessment tool was piloted for six weeks and was completed on November 7th, 2022.

All IPU nurses were asked to voluntarily complete an anonymous pre-implementation survey to evaluate current knowledge, beliefs, and practices. All IPU nurses were also asked to attend an in-person education and training session or view the education and training materials online. Healthy snacks and treats were offered as incentives to attend the in-person education and training sessions.

The 4AT assessment tool was printed on paper and IPU nurses were asked to perform the 4AT assessment and record the results once per shift (every 12 hours). If the patient triggered a positive delirium score, the IPU nurses were asked to provide delirium education with the family and document that education was completed. The IPU nurses were also asked to record if

non-pharmacologic or pharmacologic interventions were utilized and if the positive score changed the patient from a routine level of care to a GIP level of care. Routine assessments were to continue twice daily until the patient discharged or expired.

Completed assessment forms were placed in a plain manila folder at the end of each week or when the patient discharged or expires. The IPU DON transferred data collected into an excel spreadsheet on an IPU, password-protected computer. The PI met with one of the IPU nurses once and the stakeholders twice during implementation for review of data and evaluation of the implementation process. After implementation concluded, the IPU nurses were asked to complete the post-implementation survey. Quantitative and qualitative data collected during implementation was reviewed and analyzed after implementation. Results were disseminated to the IPU staff and agency stakeholders.

Instruments

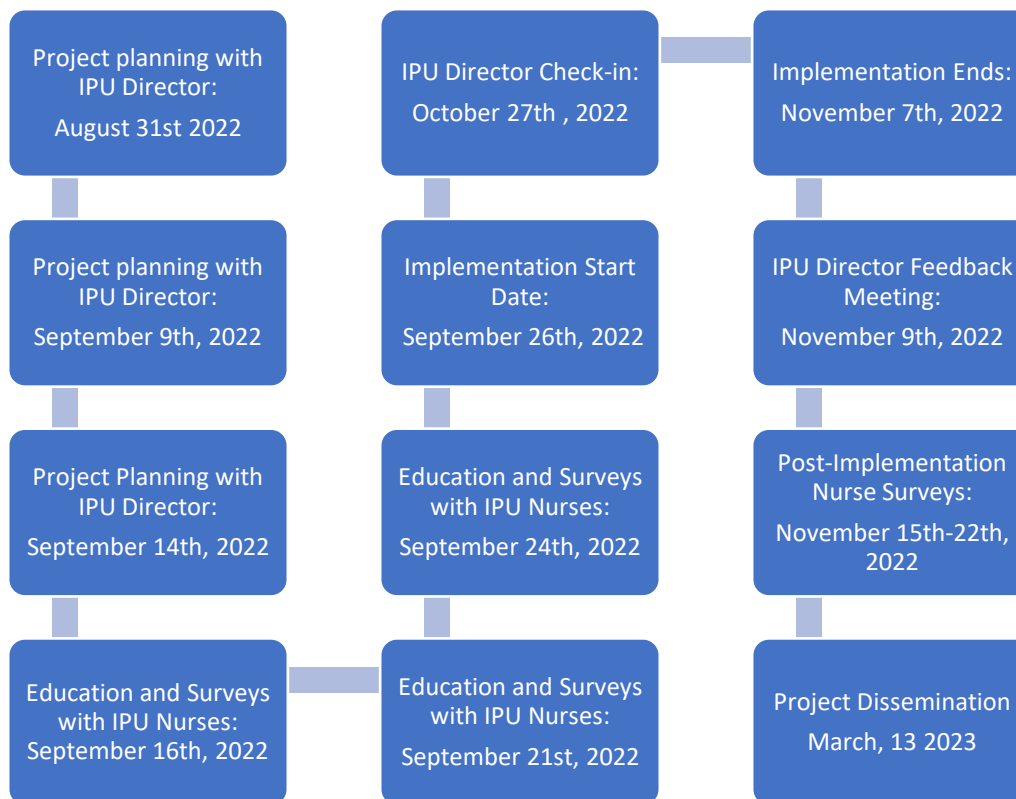
Several instruments were used to measure the outcomes of this project. The first instrument was a survey designed by the PI to assess IPU nurse current knowledge, perceptions, and experiences regarding delirium identification and management practices (Appendix D). Responses were graded on a five-point Likert scale, ranging from (1) strongly disagree to (5) strongly agree. The IPU nurses were asked to complete the survey prior to viewing the PowerPoint education and again at the end of project implementation. This was intended to appraise any changes in nurse knowledge, attitudes, and practices regarding delirium identification and management before and after implementation.

The second instrument is the 4AT delirium assessment tool (Appendix E). Permissions were not required for the use of this tool. The 4AT is one of the most common delirium assessment tools used in clinical practice (MacLulich, 2011). It has been well-validated in 17

studies and in a variety of settings. The 4AT has been shown to improve delirium detection rates with routine use. A recent meta-analysis of diagnostic accuracy found the 4AT demonstrated a pooled sensitivity of 88% and pooled specificity of 88% (Tieges et al., 2020). Furthermore, the 4AT recent studies have tested its validity within hospice and palliative populations and found it to be reliable for delirium detection in this population (Arnold et al., 2021; Baird & Spiller, 2017; Recchia et al., 2021).

The 4AT was chosen for its simplicity as well as its high sensitivity and specificity. The 4AT is designed to be rapid bedside assessment that takes less than 2 minutes to complete (MacLulich, 2011). It does not require any specialized training to use. Assessment includes four features of delirium: alertness, cognition, attention, and acute change or fluctuating course. A cut-off score of four or above is considered positive for possible delirium. Since there was no baseline data on delirium assessment for comparison, the PI collected data to measure how often the nurses used the assessment tool and how many patients were identified as having a positive delirium score during the implementation phase.

The third instrument used was a delirium education tool created by the PI for family instruction (Appendix F). This tool uses simple language to define delirium and explain why it occurs so often for hospice patients. The education tool also outlines interventions used by IPU staff to manage delirium and identifies interventions the family can use to increase comfort. The goal of this instrument is to provide comprehensible delirium education for families and empower them to help their loved one. At the bottom of the education tool, a link is provided to access additional information on the American Delirium Society webpage for patients, families, caregivers. IPU nurses were asked to review the delirium education tool with family/caregivers and provide the family with a paper copy of the education.

Figure 1***Timeline and Critical Milestones*****IRB Approval**

Approval for this project was received from the UNCG IRB Human Ethics Committee. Nurse surveys were either printed on paper and completed on-site or collected via Survey Monkey. All responses collected were anonymous. Printed surveys were placed in a folder and kept in a locked file cabinet and all electronic responses were stored on a password protected computer. Data collected on paper during implementation was placed in a plain manila folder and kept in a secured office. The data was then entered on an excel spreadsheet by the IPU DON and stored on a password protected computer. All data collected was de-identified to ensure patient privacy and no protected health information was collected by the PI.

Data Analysis

Project data collected includes the anonymous pre- and post-implementation nurse surveys. This survey includes nine quantitative questions and one qualitative question. The results of this pre- and post-implementation nurse survey are compared using tables of percentages to show quantitative changes in nurse knowledge, perception, and practice. Qualitative data gathered from the survey is presented in narrative form. Data collection during implementation includes descriptive statistics showing the total number of assessments completed, positive and negative delirium scores, family education completed, interventions used for positive scores, and if the patient's level of care changed from routine to GIP due to a positive assessment score. A table of descriptive data is used to display these results.

Results

There were 22 nurses working in the IPU during the time of implementation from September 26th-November 7th, 2022. Response rate, sample size, and demographics are displayed in Table 1. Of these 22 nurses, 11 nurses participated in the pre-implementation survey for a response rate of 50%. There were only 2 nurses who participated in the post-implementation survey, for a response rate of 9%. All the IPU nurses (100%) who participated were RN's. Of the participating nurses, there were four nurses (31%) with 1-4 years of hospice experience, one nurse (8%) with 5-9 years of hospice experience, five nurses (38%) with 10-14 years of hospice experience, two nurses (15%) with 15-19 years of hospice experience, and one nurse (8%) with 25+ years of hospice experience.

Table 1*Demographics, Response Rate, Sample Size*

	n	%
Total IPU Nurses	22	100%
RN's	22	100%
Full Time	14	63%
Part Time	3	14%
PRN	5	23%
Pre-Survey Response Rate	11	50%
Post-Survey Response Rate	2	9%
Years of Hospice Experience		
1-4 years	4	31%
5-9 years	1	8%
10-14 years	5	38%
15-19 years	2	15%
20-24 years	0	0%
25+ years	1	8%

The pre-implementation nurse survey data was collected from September 16th, 2011-September 26th, 2022, and results are shown in Table 2. Most of the nurses (82%) agreed or strongly agreed that they see delirium frequently in their current practice setting. All the nurses (100%) agreed or strongly agreed they assess for delirium on a routine basis. Most (82%) of the nurses agreed or strongly agreed that they feel confident identifying delirium and the majority (91%) agreed or strongly agreed that they feel knowledgeable about delirium management. Nearly three quarters (73%) of the nurses agreed or strongly agreed that they routinely educate their patients and families about delirium. Only one nurse disagreed that delirium can be reversible in hospice patients, while over half (55%) were neutral, and just over one third (36%) agreed. Almost one third (27%) disagreed with non-pharmacologic interventions being the most effective delirium management strategies, about one third (36%) were neutral, and about one

third (36%) agreed or strongly agreed. Only one nurse (9%) disagreed that pharmacologic interventions are the most effective delirium management strategies, while almost one third (27%) were neutral, and two thirds (63%) agreed or strongly agreed. About two thirds (64%) of the nurses agreed or strongly agreed that a delirium screening tool would be useful to them and about one third (36%) were neutral.

Table 2

Pre-Implementation Nurse Survey

	Strongly Disagree or Disagree	Neutral	Agree or Strongly Agree
I see delirium frequently in my current practice setting.		2 (18%)	9 (82%)
I assess for delirium on a routine basis.			11 (100%)
I feel confident identifying delirium.		2 (18%)	9 (82%)
I feel knowledgeable about delirium management.	1 (9%)		10 (91%)
I routinely educate my patients and families about delirium.		3 (27%)	8 (73%)
I believe delirium can be reversible in hospice patients.	1 (9%)	6 (55%)	4 (36%)
I believe non-pharmacologic interventions are the most effective delirium management strategies.	3 (27%)	4 (36%)	4 (36%)

I believe pharmacologic interventions are the most effective delirium management strategies.	1 (9%)	3 (27%)	7 (64%)
I believe a delirium screening tool would be useful to me.		4 (36%)	7 (64%)

There was one qualitative question which asked for “any additional information you feel is important regarding your current knowledge, perception, or practices regarding delirium.” One response was collected from the pre-implementation survey:

“I believe reorientation and calm familiar environment is the best way to prevent and lesson delirium, but medication is most effective at symptom management of the symptoms often associated with delirium such as anxiety and agitation.”

One informal interview occurred with one IPU nurse in week four of implementation to gather qualitative feedback on the project. During this interview it was established that staff participation was low for routine assessment and providing family education. Themes identified as barriers to participation included time constraints and stress related to short-staffing, utility of using an assessment tool in this setting, and concerns regarding using the word delirium when providing family education.

The post-implementation survey data was collected from November 15th-November 22nd, 2022, and the results are shown in Table 3. One nurse (50%) disagreed that they see delirium frequently in their current practice setting and one nurse (50%) agreed. Both nurses (100%) agreed that they assess for delirium on a routine basis. Both nurses (100%) were neutral about their confidence identifying delirium. One nurse (50%) was about their delirium management knowledge, while one nurse (50%) agreed they do feel knowledgeable about delirium

management. One nurse (50%) disagreed that they routinely educate my patients and families about delirium and one nurse (50%) agreed that they do routinely educate their patients and families about delirium. Both nurses (100%) were about their belief that delirium can be reversible in hospice patients. Both nurses (100%) were neutral about their belief that non-pharmacologic interventions are the most effective delirium management strategies. Both nurses (100%) are neutral about their belief that pharmacologic interventions are the most effective delirium management strategies. Both nurses (100%) disagreed or strongly disagreed that a delirium screening tool would be useful to me,” 100% disagree or 50% strongly disagree.

Table 3

Post-Implementation Nurse Survey

	Strongly Disagree or Disagree	Neutral	Agree or Strongly Agree
I see delirium frequently in my current practice setting.	1 (50%)		1 (50%)
I assess for delirium on a routine basis.			2 (100%)
I feel confident identifying delirium.		2 (100%)	
I feel knowledgeable about delirium management.		1 (50%)	1 (50%)
I routinely educate my patients and families about delirium.	1 (50%)		1 (50%)
I believe delirium can be reversible in hospice patients.		2 (100%)	

I believe non-pharmacologic interventions are the most effective delirium management strategies.	2 (100%)
I believe pharmacologic interventions are the most effective delirium management strategies.	2 (100%)
I believe a delirium screening tool would be useful to me.	2 (100%)

The qualitative question (Q10) was changed on the post-implementation survey to request additional feedback regarding barriers to implementation and completing family education. “Please give feedback on any barriers you encountered to using this tool and if you did the family education – why or why not?” One response was collected from the pre-implementation survey:

“Did not have to use this tool.”

Data collection for delirium assessment, family education, interventions, and GIP flip occurred from September 26th-November 7th, 2022, and the results are shown in table 4. Results include the total number of assessments completed, the number of positive and negative assessments, whether education was completed, which interventions were used for positive delirium identification, and the number of patients changed to GIP level of care. There were 49 total assessments completed during the implementation period. There were 44 positive assessment scores (90%) and five negative assessment scores (10%). Family education was completed ten times (23%) with a positive score. Family education was not completed 34 times

(77%) with a positive score. Non-pharmacological interventions alone were used 18 times (41%) for a positive score and pharmacologic interventions alone were used three times (7%) for a positive assessment score. Both pharmacologic and non-pharmacologic interventions were used together 15 times (34%) for a positive score. No interventions were used eight times (18%) for a positive assessment score. There was one time (2%) a positive assessment score changed a patient from routine to (GIP) level of care, 7 times (16%) the patient was already GIP level of care, and 36 times (82%) a positive assessment score did not change the patient to GIP level of care.

Table 4

Data Collected During Implementation

	n	%
4AT Assessments		
Total	49	100%
Positive	44	90%
Negative	5	10%
Education Completed with Positive Score		
Yes	10	23%
No	34	77%
Interventions with Positive Score		
Pharmacologic	3	7%
Non-Pharmacologic	18	41%
Both	15	34%
None	8	18%
GIP Flip		
Yes	1	2%
No	36	82%
Already GIP	7	16%

Identify barriers to success

Barriers to successful data collection included time constraints, lack of nursing staff involvement, and inadequate follow-up. It was challenging to find time to meet with key stakeholders as a group. Meetings had to be scheduled with them individually to discuss project information and coordinated independently. Nursing staff involvement in the planning and implementation stages was deterred by staffing shortages and scheduling conflicts. Implementation was also postponed by two weeks due to an agency accreditation visit. This limited the amount of time available to schedule and complete the IPU nurse surveys and education to one week. Additionally, weekly requests were made for feedback and/or meetings with the IPU DON to assess and evaluate implementation progress, however, no response were received for any meaningful feedback until week five.

Strengths to overcome barriers

To overcome barriers, the PI developed good working relationships with the key stakeholders and received significant agency support for the project. The stakeholders made time to meet in-person and virtually to overcome scheduling barriers. The PI summarized and coordinated all information discussed in the individual meetings and sent emails for clarification and approval. The PI offered three separate on-site nurse education meetings at different times of the day and on the weekend to accommodate as many nurses as possible. The PI also brought healthy snacks and treats to each meeting as incentives to encourage participation. The PI created electronic options for completing the survey and viewing the education to access the nurses who were not able to attend in person and encourage participation. The PI sought out verbal commentary from one IPU nurse to get feedback on implementation after failed attempts to connect with the IPU DON.

Discussion

Hospice is designed to provide holistic care and outpatient symptom management for terminal patients and support for their families (Kline & Panosky, 2017). Delirium is a complex neuropsychiatric condition which is common in the hospice population (Arnold et al., 2021; Watt et al., 2019). Delirium can negatively impact hospice patients, families, clinicians, and the healthcare system in significant ways. International guidelines recommend routine use of a validated delirium assessment tool to increase early identification of delirium and improve outcomes for hospice and palliative patients (Scottish Intercollegiate Guidelines Network, 2019). Hospice nurses are optimally positioned to assess for delirium, but few clinicians use any type of validated assessment tool in routine practice (Harris et al., 2020; Watt et al., 2021, Woodhouse et al., 2020). The Hospice and Palliative Care agency chosen for this project does not utilize any delirium assessment tool for clinical practice. The aim of this project was to implement a delirium assessment tool in a hospice setting with a goal of increasing routine delirium assessment and identification, increasing hospice nurse knowledge about delirium, and increasing family education about delirium.

Conceptual Framework

Lewin's Change Model was used as the framework for this project. Restraining forces that hindered the unfreezing and change process included time constraints, knowledge deficits, and staff reluctance to abandon old habits. The PI intended to address these forces by forming a focus group to include several of the IPU nurses. This focus group was to meet before implementation to receive extensive delirium education and involve members of the IPU nursing staff in the planning phase. The focus group was also to meet biweekly during, and once after implementation to incorporate real-time feedback. However, due to timing of implementation

and staffing shortages, this was not possible. The PI had to meet separately with three individual stakeholders to discuss measures to overcome these forces.

The 4AT assessment tool that was selected specifically to address time constraints. This tool was designed for rapid assessment. The IPU director also created a form that allowed the nurses to collect all information on one page to keep documentation simple. The front of the form allowed the nurse to document up to one week's worth of 4AT assessments. On the backside of the form the nurse was able to check a box indicating when family education had been completed, identify if they used non-pharmacologic or pharmacologic interventions, and if the patient flipped from a routine to a GIP level of care.

To address knowledge deficits and influence reluctance to abandon old habits, the PI created a PowerPoint presentation which provided evidence-based information about delirium. Three in-person nurse education sessions were scheduled to present this information to the IPU nurses. However, in-person attendance was low. There were five nurses at the first meeting, two nurses at the second meeting and one nurse at the final meeting. The PI then added a voiced recording to PowerPoint presentation, and this was sent to each IPU nurse to review prior to implementation. The nurses were asked to complete the pre-implementation nurse survey prior to viewing the education materials. Eleven nurses completed the survey, and it is unknown how many viewed the PowerPoint education prior to implementation.

Translational Framework

The Plan-Do-Study-Act model was selected as the translational framework for implementation of this project. This was designed to be a cyclical process to encourage a continual assessment, evaluation, and adjustment of the implementation process. The PI had planned to meet with the IPU nurse focus group before, during and after implementation to

increase staff engagement in the PDSA process. However, with no focus group, the PI relied on feedback from the IPU director. The PI requested weekly updates and feedback on implementation and project data from the IPU director, however, no updates or feedback were received for the first four weeks of implementation. The PI had an informal meeting with one of the IPU nurses and received verbal feedback near the end of the fourth week. The PI was able to meet with the IPU DON at the beginning of the fifth week of implementation. The PI and IPU director discussed staff nurse feedback which included concerns related to time constraints, short staffing, appropriateness of routine delirium assessment in this setting, and use of the word “delirium” with family education. At this time, the IPU director verbalized intent to meet with IPU nurses to provide additional education addressing these concerns and encouraging participation. The project continued for the final two weeks, and the PI met once more with the IPU DON the day after implementation concluded.

Interpretation

Hospice patients with complex, end-stage illness have the greatest risk for developing delirium and numerous studies have described the high prevalence of delirium in this population (Arnold et al., 2022; Recchia et al., 2022; Sinchak & Deguzman, 2021; Watt et al., 2019). Global organ failure and escalating symptom management modalities in the final stages of life often influence this inevitable outcome. This project data aligns similarly with other studies that have reported delirium estimates up to 88% for patients who are in the final days to weeks of life (Watt et al., 2019). The majority of patient beds in this IPU are reserved for care in the final two weeks of life. And, although only a small number of 4AT assessments were completed over the implementation period, 90% of them were positive for delirium. Previous research has indicated that identification of terminal delirium remains necessary to ensure adequate symptom

management and alleviate suffering (Agar, 2020; Aligeti et al., 2016). This project finding supports the need for accurate delirium identification to ensure proper management, family support, and best care outcomes.

In-patient hospice nurses play an essential role in delirium assessment due to the frequency of intimate patient care (Sinchak & DeGuzman, 2021). Best practice suggests a professional obligation to utilize a systematic and comprehensive approach to delirium assessment. Yet, previous research has indicated that most hospice clinicians do not routinely assess for delirium and do not use validated assessment tools to identify delirium (Harris et al., 2020; Woodhouse et al., 2020). All IPU nurses (100%) reported on the pre-implementation survey that they routinely assess for delirium, and the majority (91%) reported feeling confident in identifying delirium. However, no systematic assessment process existed, and no formal tool was being used prior to implementation. This finding corresponds with other studies that indicate that there are wide variations for delirium assessment in clinical practice among hospice clinicians (Watt et al., 2019). Additional research is needed to examine how these nurses are assessing for delirium and what criteria they are using to identify it.

Almost two thirds (64%) of the IPU nurses indicated on the pre-implementation survey that they believed a delirium screening tool would be useful to them. However, the post-implementation survey found that 100% of the IPU nurses did not agree that a delirium screening tool would be useful to them. Qualitative data gathered on the post-implementation survey and informal nurse interview identified the primary barriers to routine assessment as strain related to short staffing and knowledge deficits regarding the utility of an assessment tool in this setting. This is consistent with previous research that recognized a combination of discipline specific and systemic factors that can impede comprehensive delirium assessment (Hosie et al., 2014). Nurse

shortages within the facility increase workload pressures and stress, causing additional assessment and documentation to feel burdensome. Embedding the delirium assessment tool within the patient electronic medical record (EMR), where possible, may reduce the burden of routine assessment for overtaxed IPU nurses. Gaps in hospice specific delirium education create a lack of understanding about the benefit of using a formal assessment tool in a setting where delirium is known to be highly prevalent. Additional staffing support and hospice specific delirium education may be useful to the integration of a structured assessment process in the future.

One of the most important roles of a hospice nurse is that of educator. Providing thorough and comprehensible education with compassion helps to alleviate fear of the unknown. The majority of IPU nurses (73%) reported routinely educating families about delirium on the pre-implementation survey, however, data collected showed that education was only completed 23% of the time with a positive delirium score. Qualitative data collected from the informal nurse interview found that the many of the IPU nurses were reluctant to use the word “delirium” when educating families. They felt this would increase family fear and anxiety, leading to requests for inappropriate interventions or discontinuation of necessary treatments. This was perceived as a stressor to the IPU nurses and therefore avoided altogether.

Delirium education with family and caregivers is a vital part of delirium management and should be addressed by the hospice nurse (Bush et al., 2017; Harris et al., 2020; Luth et al., 2021). Most families have minimal knowledge about delirium and this uncertainty can lead to apprehension, distrust, and frustration with the care team (Shrestha & Fick, 2020). Conversely, family caregivers appreciate support and education from clinicians, especially meaningful information about the commonality, etiology, pathogenesis, and treatment options for delirium

management. Whether delirium is reversible or terminal, families want to be informed and involved in making person-centered care decisions. Education about terminal delirium management also empowers families to help and support their loved one, which may ultimately relieve some of the patient care burden on IPU nursing staff.

The primary goal for terminal delirium management is comfort. Non-pharmacologic interventions are the preferred treatment with pharmacologic interventions only being used to control severe symptoms that cause distress or compromise safety (Bush et al., 2018; Bramati & Bruera, 2021; Kates, 2020). Nearly all of the IPU nurses (91%) reported on the pre-implementation survey that they felt knowledgeable about delirium management, yet 64% agreed that pharmacologic management is the most effective delirium management strategy, while only 36% agreed that non-pharmacologic interventions are most effective. This data intimates that additional education is needed regarding recommended delirium management. However, data collected during implementation revealed that among patients with positive delirium scores, pharmacologic interventions alone were used only 7% of the time, while 41% of the time non-pharmacologic interventions alone were used. IPU nurses reported using both pharmacologic and non-pharmacologic interventions 35% of the time and no interventions 18% of the time to manage delirium. This data may be explained by the sub-type of delirium that presents in the IPU.

Hypoactive delirium is the reported to be the most common subtype at end-of life (Bramati & Bruera, 2021; Bush et al., 2017; Luth et al., 2021; Watt et al., 2019). Hypoactive delirium may appear as peaceful sleeping. Most families and hospice nurses perceive this as comfort and choose non-pharmacologic interventions alone to maintain this state. Alternatively, hyperactive, and mixed delirium often necessitate pharmacologic management to maintain safety

and comfort. Hospice nurses frequently use ambiguous language such as “terminal agitation” or “terminal restlessness” to describe delirium and may, therefore, associate delirium management with hyperactive or mixed delirium only (Hosie et al., 2014). This may elucidate why most of the IPU nurses believe that pharmacologic interventions are the most effective management strategies, while the data shows a higher rates of non-pharmacologic intervention use.

Limitations

Although half of the IPU nurses participated in the pre-implementation survey, only two nurses completed the post-implementation survey. This attrition prohibits any meaningful comparison or quantification of changes in nurse knowledge, beliefs, and practices before and after implementation. Furthermore, the data collected during implementation was insufficient to be statistically significant. The average daily census during the implementation period was 10 patients, and the nurses were asked to complete the assessment once during each shift (twice daily). This would have been approximately 840 total assessments over the six-week implementation period. There were only 49 total assessments completed during implementation, meaning routine assessment was only performed approximately 6% of the time. The small number of assessments completed over the course of implementation limits the generalizability of project results.

Recommendations for Future Study

Future quality improvement projects with aims to implement a delirium assessment tool should include a focus on comprehensive nurse education about delirium specific to the hospice population. Education should also emphasize the significance of routine assessment and family education for effective delirium management. It is recommended for future projects to make a concentrated effort to have meaningful staff involvement in each stage of the PDSA cycle to

increase staff buy-in and ensure sufficient participation. It is also recommended to have ample staff support in place during the implementation process to reduce workload pressures.

Additionally, embedding the assessment tool into the patient EMR, when possible, would allow for smoother incorporation into routine daily assessment.

Future studies should also examine the delirium screening and diagnostic practices among hospice and palliative care clinicians. Research is needed to evaluate how hospice clinicians identify delirium and why formal assessment tools are not used in routine practice. Furthermore, there is limited data validating the existing delirium assessment tools in the hospice population. The 4AT delirium assessment tool is commonly used in a variety of settings and recent studies have validated its use in hospice care. However, more research is needed to study which tool is most efficacious for assessing delirium in the hospice population and gauge their utility across all hospice settings; IPU, home care, and long-term care.

Conclusion

Hospice care provides palliation for individuals with a life expectancy of six months or less. Delirium is highly prevalent in this population and often deleterious to hospice patients, families, and clinicians. Research has shown that routine assessment can increase delirium identification and improve outcomes, however most hospice clinicians do not use any structured delirium assessment process. The purpose of this quality improvement project was to implement a validated delirium assessment tool in a hospice setting to increase routine assessment and identification, increase hospice nurse knowledge, and increase family education about delirium.

This project found congruence with previous studies that reported delirium rates up to 88% in the final days to weeks of life. Due to this high prevalence and short staffing, the IPU nurses felt overburdened by routine assessment and found little value in using the 4AT delirium

assessment tool. This finding may hint to why most hospice clinicians prefer to rely on clinical judgement alone and suggests that additional training and staff resources are needed to successfully incorporate a structured assessment into routine practice. Low rates of family education and reluctance to use the word “delirium” may also indicate a need for more thorough instruction with the nursing staff about the importance of family education as part of delirium management. However, high attrition limited the appraisal of nursing knowledge and practice, and low participation limited the generalizability of project results.

Delirium affects nearly all hospice patients on their journey towards end of life. Delirium can be traumatic and devastating for hospice patients and families and arduous for the hospice team to manage. Hospice clinicians have a professional obligation to follow best practice guidelines and utilize a routine assessment process to ensure prompt delirium identification and effective delirium management. Delirium management should include compassionate, meaningful education of family members to alleviate anxiety, foster trust, and empower caregivers to support their loved one. Future projects that aim to implement a delirium assessment tool should endeavor to provide comprehensive delirium education to nursing staff, engage nursing staff fully in the PDSA cycle, and ensure adequate staff resources.

“I have abided by the UNCG academic integrity policy on this assignment.”

Karen Kaplan

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Appendix A

DSM-V criteria for Delirium Diagnosis

DSM-5 criteria for delirium

- A. A disturbance in attention (i.e., reduced ability to direct, focus, sustain, and shift attention) and awareness (reduced orientation to the environment).
- B. The disturbance develops over a short period of time (usually hours to a few days), represents a change from baseline attention and awareness, and tends to fluctuate in severity during the course of a day.
- C. An additional disturbance in cognition (e.g., memory deficit, disorientation, language, visuospatial ability, or perception).
- D. The disturbances in Criteria A and C are not explained by another preexisting, established, or evolving neurocognitive disorder and do not occur in the context of a severely reduced level of arousal, such as coma.
- E. There is evidence from the history, physical examination, or laboratory findings that the disturbance is a direct physiological consequence of another medical condition, substance intoxication or withdrawal (i.e., due to a drug of abuse or to a medication), or exposure to a toxin, or is due to multiple etiologies.

Figure A1. Reprinted with permission from the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, (Copyright ©2013). American Psychiatric Association. All Rights Reserved.

Appendix B

Lewin's Change Model

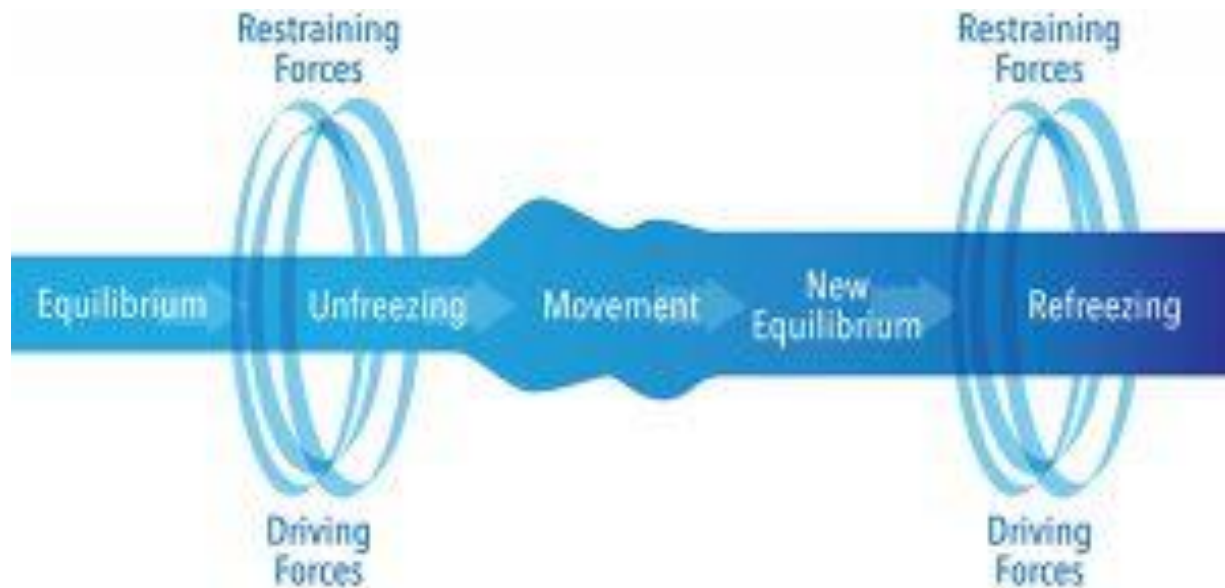


Figure B1. "The Steps of the Unfreezing–Change–Refreezing Model" by Sonia Udod and Joan Wagner, designed by [JVDW Designs](#), is licensed under a [CC BY 4.0 International License](#).

Appendix C

The Plan-Do-Study-Act Framework

The Model for Improvement

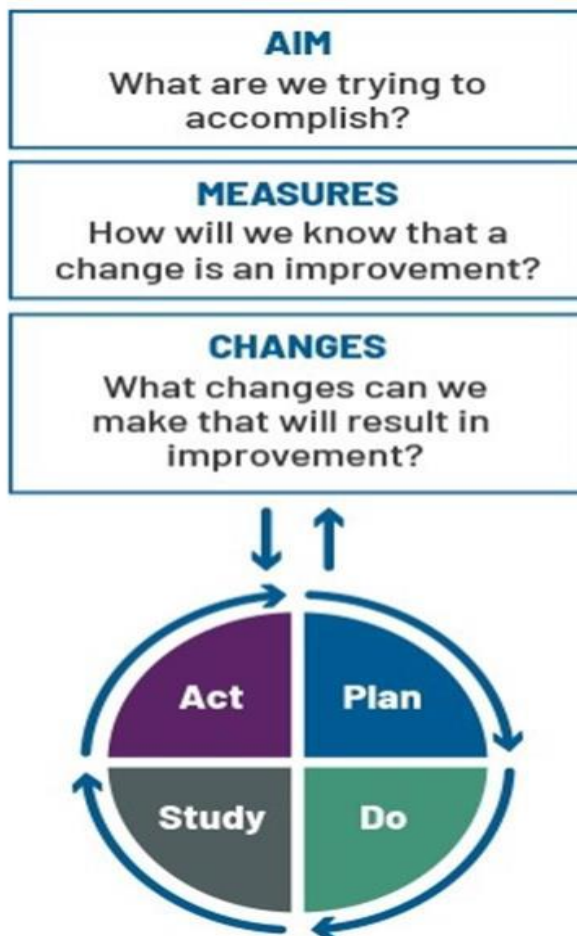
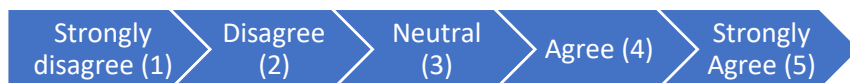


Figure C1. <https://www.ahrq.gov/sites/default/files/wysiwyg/ncepctr/resources/job-aid-model-pdsa.pdf>. No permissions were needed to reprint this image.

Appendix D

Nurse Survey



I see delirium frequently in my current practice setting.

I screen or assess for delirium on a routine basis.

I feel confident identifying delirium.

I feel knowledgeable about delirium management.

I educate my patients and families routinely about delirium.

I believe delirium can be reversible in hospice patients.

I believe non-pharmacologic interventions are the most effective delirium management strategies. (Example: reorientation, calm environment)


I believe pharmacologic interventions are the most effective delirium management strategies. (Example: Haldol, Lorazepam)

I believe a delirium screening tool would be beneficial to me.

Figure D1. This tool was created by the primary investigator to assess hospice nurse knowledge, beliefs, and practices and compare for changes before and after implementation.

Appendix E

4AT Delirium Assessment Tool



**Assessment test
for delirium &
cognitive impairment**

Patient name: (label)

Date of birth:

Patient number:

Date: Time:

Tester:

CIRCLE

[1] ALERTNESS
This includes patients who may be markedly drowsy (eg. difficult to rouse and/or obviously sleepy during assessment) or agitated/hyperactive. Observe the patient. If asleep, attempt to wake with speech or gentle touch on shoulder. Ask the patient to state their name and address to assist rating.

Normal (fully alert, but not agitated, throughout assessment)	0
Mild sleepiness for <10 seconds after waking, then normal	0
Clearly abnormal	4

[2] AMT4
Age, date of birth, place (name of the hospital or building), current year.

No mistakes	0
1 mistake	1
2 or more mistakes/untestable	2

[3] ATTENTION
Ask the patient: "Please tell me the months of the year in backwards order, starting at December." To assist initial understanding one prompt of "what is the month before December?" is permitted.

Months of the year backwards	0
Achieves 7 months or more correctly	0
Starts but scores <7 months / refuses to start	1
Untestable (cannot start because unwell, drowsy, inattentive)	2

[4] ACUTE CHANGE OR FLUCTUATING COURSE
Evidence of significant change or fluctuation in: alertness, cognition, other mental function (eg. paranoia, hallucinations) arising over the last 2 weeks and still evident in last 24hrs

No	0
Yes	4

4 or above: possible delirium +/- cognitive impairment
1-3: possible cognitive impairment
0: delirium or severe cognitive impairment unlikely (but delirium still possible if [4] information incomplete)

4AT SCORE

GUIDANCE NOTES Version 1.2. Information and download: www.the4at.com

The 4AT is a screening instrument designed for rapid initial assessment of delirium and cognitive impairment. A score of 4 or more suggests delirium but is not diagnostic: more detailed assessment of mental status may be required to reach a diagnosis. A score of 1-3 suggests cognitive impairment and more detailed cognitive testing and informant history-taking are required. A score of 0 does not definitively exclude delirium or cognitive impairment: more detailed testing may be required depending on the clinical context. Items 1-3 are rated solely on observation of the patient at the time of assessment. Item 4 requires information from one or more source(s), eg. your own knowledge of the patient, other staff who know the patient (eg. ward nurses), GP letter, case notes, carers. The tester should take account of communication difficulties (hearing impairment, dysphasia, lack of common language) when carrying out the test and interpreting the score.

Alertness: Altered level of alertness is very likely to be delirium in general hospital settings. If the patient shows significant altered alertness during the bedside assessment, score 4 for this item. **AMT4 (Abbreviated Mental Test - 4):** This score can be extracted from items in the AMT10 if the latter is done immediately before. **Acute Change or Fluctuating Course:** Fluctuation can occur without delirium in some cases of dementia, but marked fluctuation usually indicates delirium. To help elicit any hallucinations and/or paranoid thoughts ask the patient questions such as, "Are you concerned about anything going on here?"; "Do you feel frightened by anything or anyone?"; "Have you been seeing or hearing anything unusual?"

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Figure E1. <https://www.the4at.com/4at-images>. No permissions were needed to reprint this tool.

Appendix F

Delirium Education Tool

Delirium in Hospice and Palliative Patients

Delirium is a sudden change in thinking, behavior, or awareness. Delirium is common in hospice patients and is normal for patients nearing the end of life. Some people with delirium will sleep continuously and appear peaceful, while others may be awake, confused, and agitated.

How Families/Caregivers Can Help:

Spend time with your loved one.

Talk with your loved one, even if they don't respond, they can hear you.

Keep communication simple.

Reassure and redirect if your loved one becomes confused or upset.

Gentle touch – holding hands

Maintain a peaceful environment

Bring familiar objects/items from home.

Have glasses and hearing aids available.

Notify Beacon Place staff if you have any questions or concerns.

How Beacon Place Staff Can Help:

Perform routine checks for changes in patient condition.

Make sure all physical care needs are met.

Provide a safe and comfortable environment.

Give medication to make sure pain and other symptoms are well controlled.

Provide information and updates to family often.

For additional information about Delirium, please see the websites below

<https://americandeliriumsociety.org/patients-families/family-guidance/>

Figure F1. This tool was created by the primary investigator to aid the hospice nurses when providing delirium education for families.

